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TECHNICAL BULLETIN
Bridging Virtuo's Internal Amplifier

About this Technical Bulletin

This technical bulletin is for TouchTunes Virtuo Operators, TouchTunes field service, customer support, and sales personnel. This bulletin includes these sections:

About Amplifier Bridging

With the release of OpenStage 1.1.2-15, it is now possible to bridge Virtuo's internal amplifier.

Amplifier bridging enables Virtuo's internal Bang & Olufsen amplifier to produce up to 475W per channel for a maximum of 900W.

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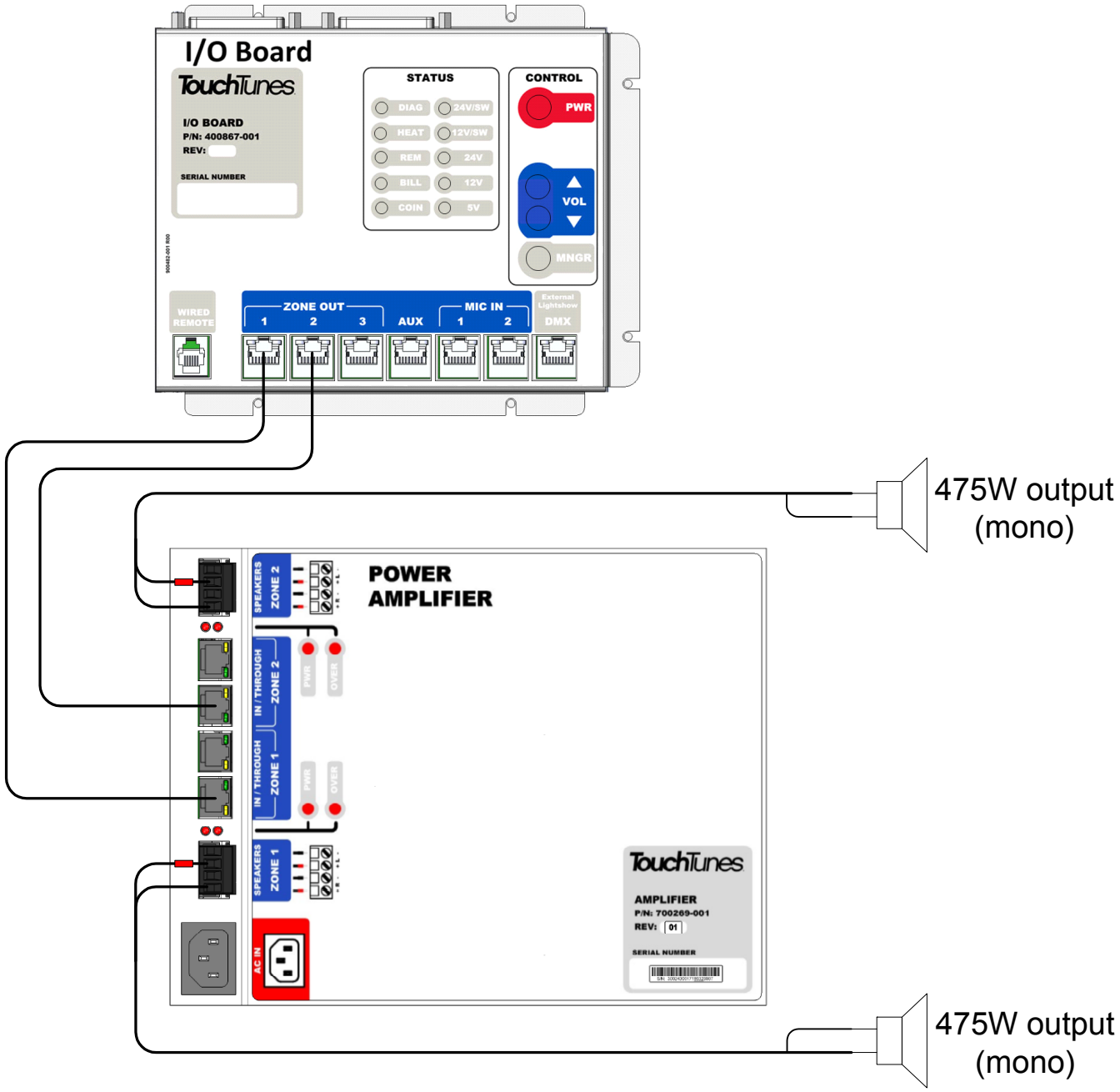
Bridged Amplifier Configuration

The following is a schematic of the wiring configuration required when bridging both Zone 1 and Zone 2:



This configuration results in the following:

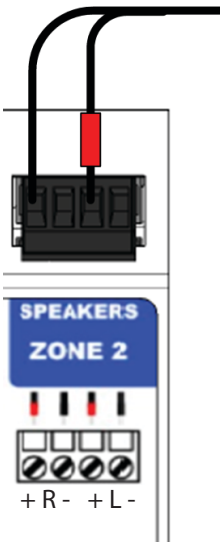
- Output is forced to mono
- The outputs of Zones 1 and 2 can continue to be controlled individually
- The output to the speakers is 475W per channel, at 4Ω

You may choose to bridge only one zone, in which case the other zone will not be affected, and does not need to be rewired.

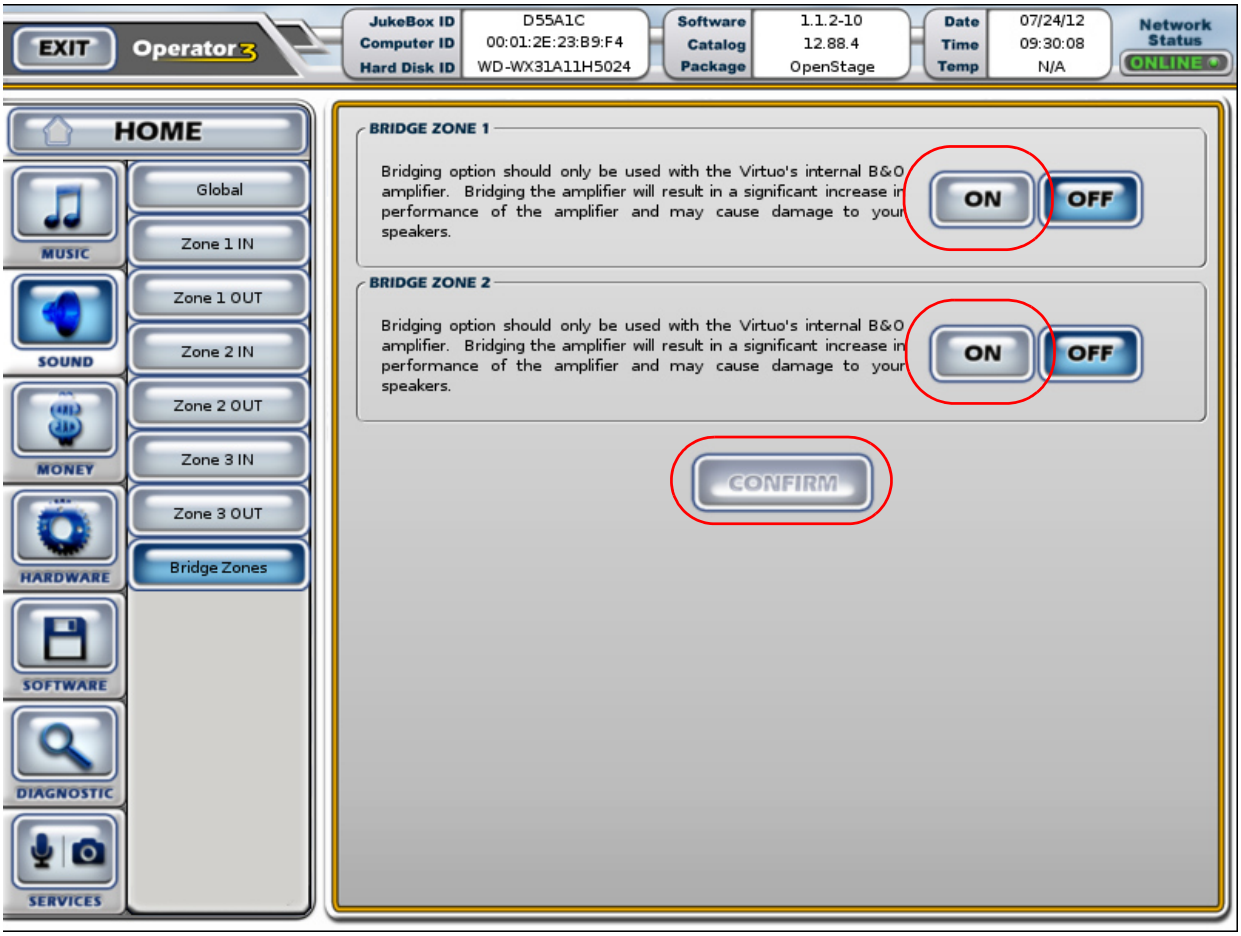
Warning: If you elect not to bridge a zone, you must not enable bridging for that zone in the OpenStage software. Turning the bridge feature on for a zone without rewiring it will cause a degradation of audio quality, and could also damage your speakers. For the same reasons, if you rewire a zone, you must also enable bridging for that zone in OpenStage.

How to Bridge the Amplifier

1. Pause Virtuo.
2. Unlock and open Virtuo's front door.
3. Disconnect the euroblock connectors from the Zone(s) you will be bridging.
4. Rewire the speaker cables going into the disconnected euroblock connectors as follows:
    - One negative wire (usually black) into Right Positive (R+)
    - One positive wire (usually has a red jacket) into Left Positive (L+)
    - The other two terminals on the euroblock are left empty
    - When bridging both Zone 1 and Zone 2, it is very important to wire both zones identically; not doing so can negatively affect audio quality, as the two zones would be out of phase

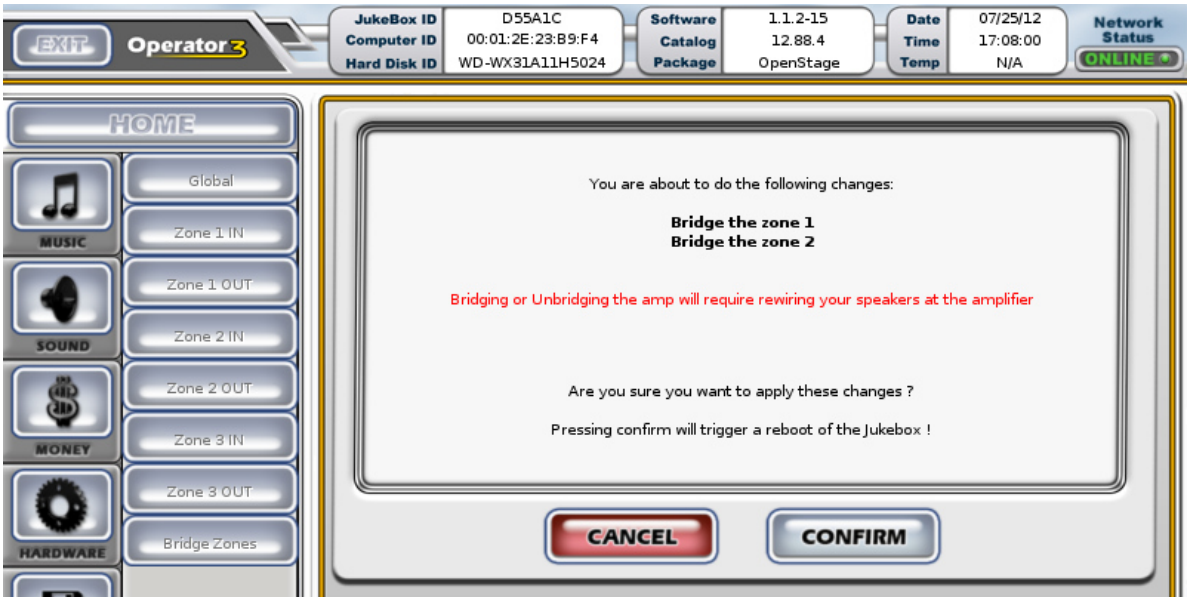


5. Re-connect the euroblock connectors into the appropriate zones on the amplifier.
6. On the jukebox, launch the Operator Menu.
7. Navigate to Sound | Zone X Out (where X is each zone you are bridging) and change the following settings as required:
    - Set Balance to the middle
    - Set Bass Boost to Off
    - Set the volume to its lowest setting
8. Next, go to Sound | Bridge Zones.



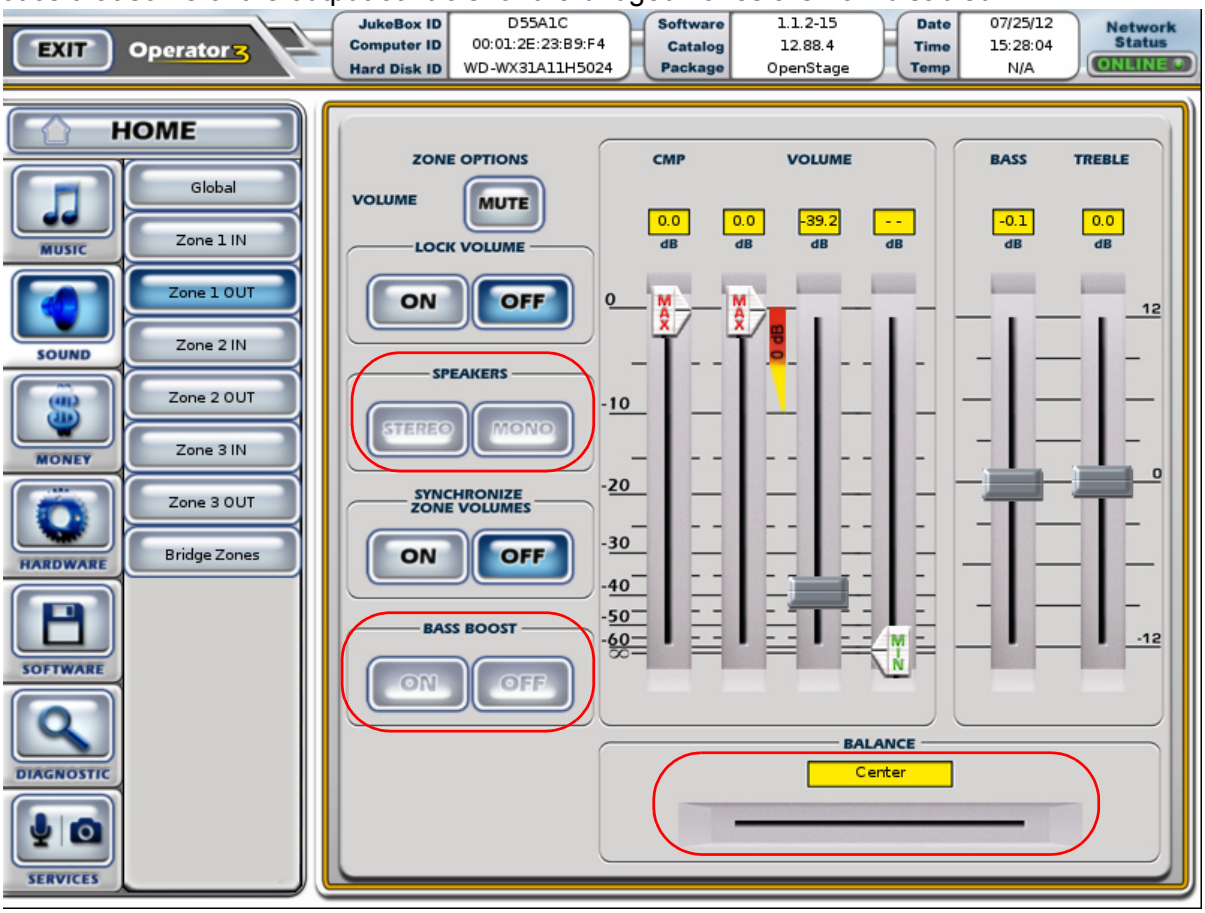
9. Turn on bridging ONLY for the zone(s) you rewired.
10. Tap the "Confirm" button to apply the change.

11. You will be prompted to confirm again, as toggling the bridging function requires a reboot:



12. At this point, Virtuo will reboot to enable bridging. Take this time to review your wiring.
13. Once Virtuo has rebooted, if CMP was already active on that jukebox, music should now be playing through the rewired speakers.
14. Queue up a few songs to help you adjust the volume levels.
15. Adjust the volume levels for the bridged zones.

You will notice that some of the output controls for the bridged zones are now disabled:



Bridging forces a Zone to mono, so the mono/stereo and balance controls are now disabled. The bass boost control is also disabled, since the amplifier is now outputting significantly more power than previously.

Safety Considerations and Recommendations

Before connecting them to the bridged amplifier, make sure your speakers are rated for at least 475W at 4Ω. Using speakers that are not appropriately rated could damage the speakers.

Bridging should only be used with Virtuo's internal Bang & Olufsen amplifier. Attempting this with any other amplifier (including the ones offered by TouchTunes for other jukebox models or in the Virtuo Floor Stand) could cause degraded audio quality, and damage to the amplifier or the speakers.

While Bridged Mode is on, the "Through" connectors on the amplifier should not be used.

Troubleshooting

Below are solutions to any issues you may face after rewiring your speakers and activating amplifier bridging:

Problem	Probable Causes	Solution
No sound at all	• Certain connections were not made properly, preventing audio from being transmitted • Virtuo's internal amplifier has gone into protection mode, due to an electrical problem (short-circuit, overload, etc.) • Virtuo is paused, or volume is too low	• Review all connections, following the schematic on page 2 of this document. • Review all wiring, then lower the output volume to its lowest setting, then slide it up slowly until you hear music again. • Make sure Virtuo is not paused, then raise the output volume slowly.
Degraded sound quality (no bass, distortion, abnormal artifacts)	• The speakers wired to zones 1 and 2 were not wired identically, and are out of phase • The speakers are not rated for 475W at 4Ω. • Balance was not set to the middle before bridging was activated.	• Review the wiring between the amplifier and the speakers. Make sure all speakers are wired the same (see step 4 on page 3 of this document.) • If each zone outputs to a single speaker, check that the speaker is rated no lower than 4Ω. If outputting to multiple speakers, check that the ohms load on the circuit including all the speakers on a zone is no lower than 4Ω. • Bring the volume down to its lowest level then deactivate bridging. After the reboot, set balance to the middle, then reactivate bridging. After the second reboot, raise the volume again to verify that the sound is OK.
Volume too low, despite volume setting being at or close to maximum	• Speakers have impedance much higher than 4Ω. • Problems with wiring (wires are not fully connected)	• Use different speakers or reconfigure speaker groupings (in the case where multiple speakers are connected to one zone output on the amplifier.) • Disconnect, then re-connect each speaker wire in turn, making sure each wire makes a positive connection.

Contacting TouchTunes Technical Support

If you need help with or have questions about this document, contact TouchTunes by:

- using the e-mail links on the Contacts page on the TouchTunes Dashboard at https://operator.touchtunes.com
- calling TouchTunes 24/7 Service Hotline at 847-353-1954

To help us assist you more effectively with problem reports, this information may be required when contacting TouchTunes Support:

- Jukebox model (e.g., Virtuo, Allegro MX-1, Ovation II)
- Jukebox ID
- the serial number of any component you believe to be defective
- the date/time of the problem
- actions performed immediately before the problem occurred
- any additional comments

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